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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,738	06/30/2003	Toshihiro Mandai	Q76330	7687
23373	7590	04/26/2004	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			BAREFORD, KATHERINE A	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 04/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/608,738	MANDAI ET AL.
Examiner	Art Unit	
Katherine A. Bareford	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 30 June 2003.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 4 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Claims 1-3 are canceled.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 30 June 2003 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. 10/160,226.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date 6/03.
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

1. The preliminary amendment filed June 30, 2003 has been received and entered. The Examiner notes that claims 1-3 were canceled, and claim 4 amended. This amendment left only one claim, claim 4, to be examined.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Japan 2000-167474 (hereinafter '474) in view of Japan 2000-229262 (hereinafter '262).

'474 teaches a method of manufacturing a magnetic recording medium. Abstract and paragraph [0001]. An extrusion type coating method is used to extrude coatings liquids from the ends of silts of coating heads. See paragraph [0025] (the upper and lower layers are coated by extrusion) and Figures 4-5. The extruded coating liquids are applied to a continuously running flexible support while making the support relatively approach the end of the coating head so as to apply a non-magnetic coating liquid obtained by dispersing non-magnetic particles in a solvent on the flexible support to form a non-magnetic lower layer. See paragraphs [0025] – [0029] and figures 4-5 (as shown by table 1, the lower layer is obtained by dispersing non-magnetic particles (TiO_2) in solvents). Then, before the non-magnetic lower layer is dried, a magnetic coating layer obtained by dispersing magnetic particles in a solvent on the non-magnetic lower layer is applied to the non-magnetic layer to form a magnetic upper layer. See paragraphs [0025] – [0029] and figures 4-5 (as shown by table 2, the upper layer is obtained by dispersing magnetic particles (Fe alloy) in solvents). Various features of the coating system are defined. For example, '474 teaches that the running velocity, V , of the flexible support can be 800 m/min or 13.33 m/sec.

Paragraph [0025]. The wet coating thickness of the non-magnetic layer 4 can be 1 micron (0.000001 m). Paragraph [0029] (example 7). The wet coating thickness of the magnetic layer a can be 1 micron (0.000001 m). Paragraph [0029] (example 7). The viscosity of the non-magnetic layer can be 46 centipoise at a shear rate of $10,000\ sec^{-1}$. Paragraphs [0025] – [0029] (layer 4, as shown on table 1). The viscosity of the magnetic layer can be 51 centipoise at a shear rate of $10,000\ sec^{-1}$. Paragraphs [0025] – [0029] (layer a, as shown on table 2). It is the Examiner's position that it would be inherent that the viscosity of these exemplary liquids at a

shear rate of 100,000 sec⁻¹ would be approximately 10 centipoise (0.1 Poise = 0.01 Pa·s). This is demonstrated by Shibata et al (US 5397600), figure 4 and column 11, lines 60-65) which demonstrate the conventional range of viscosities of a particle containing coating liquids at different shear viscosities. As shown by that figure 4 of Shibata, a conventional magnetic coating liquid with a viscosity of approximately 40-50 centipoise (or 0.4-0.5 Poise) at a shear velocity of 10,000 sec⁻¹ would have a viscosity of approximately 10 centipoise (or 0.1 Poise) at a shear velocity of 100,000 sec⁻¹. '474 teaches that it is desired that the lower coating liquid have a static viscosity of greater than 1 Poise and a viscosity at 10,000 sec⁻¹ of 50 centipoise or less. See the abstract.

'474 teaches all the features of this claim except the length L of the flexible support "opposite face" at the downstream side of the slit discharging the magnetic coating liquid.

However, '262 teaches a method of manufacturing a magnetic recording medium. Abstract and paragraph [0018]. An extrusion type coating method is used to extrude coating liquid from an end of a slit of a coating head. Figure 1 and paragraph [0026]. The extruded coating liquid is applied to a continuously running flexible support while making the support relatively approach the end of the coating head so as to apply a magnetic coating liquid. Figure 1 and paragraph [0026]. The magnetic coating liquid is obtained by dispersing magnetic particles in a solvent on the flexible support so as to form a magnetic-coating-liquid layer and coated product. Figure 1 and paragraphs [0034] – [0036]. '262 further teaches a length of the coating head on the downstream side of the slit at the end of the coating head (the length can be 0.6 mm or 0.0006 m). See figure 3 and paragraph [0036]. This length would be no shorter than the

length L of a flexible support opposite the face of the coating head at the downstream side of the slit. See the distance shown by figure 3. '262 teaches that it is desired that the lower coating liquid have a static viscosity of greater than 1 Poise and a viscosity at 10,000 sec⁻¹ of 50 centipoise or less. See paragraph [0013].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '474 to a coating die with the length L as described and suggested by '262 in order to provide a desirable final coated product, because '474 teaches extrusion die coating of a magnetic coating liquid with viscosities and '262 teaches that when extrusion die coating of a magnetic coating liquid, a desirable L length would be 0.6 mm. As a result, when a length L as taught by '262 is used with the extrusion die for coating the upper magnetic layer are used in the process of '474 as described, the claimed shearing energy formula (of claim 4) provides as follows:

$$\alpha = \mu_1/\mu_2 = 0.01/0.01 = 1$$

$$V_c = V/(1 + \alpha \cdot t_1/t_2)^{1/2} = 13.33/(1 + 1 \cdot 1)^{1/2} = 9.45$$

$$E = \mu_2 \cdot L \cdot V_c^3/4 \cdot t_2 \cdot V^2 = (0.01 \text{ Pa}\cdot\text{s})(0.0006 \text{ m})(9.45 \text{ m/s})(9.45 \text{ m/s})/(4)(0.000001 \text{ m})(0.000001 \text{ m})(13.33 \text{ m/s})(13.33 \text{ m/s}) = 7.12 \times 10^6.$$

As a result, the applied coating would be applied using an apparatus such as that claimed by applicant with a shearing energy in the range claimed by applicant, and therefore, the resulting product would meet all the requirements of the structure of claim 4. The Examiner notes that the evaluating process of the claim does not have to be carried out to provide the product of the claim, since meeting the requirements as to the shearing energy, at the least, will provide the required structure. Similarly, a single coating die with two slits would not be needed, since two

extrusion coating heads provided sequentially will provide the required two layer coating structure of the claimed product.

5. Tomaru et al (US 2002/0009548) is a publication of the US application of Japan 2000-167474. Chino et al (US 4854262) also provides measurements when using extrusion die coaters on flexible webs (see figure 3 and column 4, lines 10-20, for example).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:30-4:00) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (571) 272-1415. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kath A. Bareford
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PRIMARY EXAMINER
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